

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 Navy METOC Support (Space)	4,266	10,378	12,770	17,396	16,666	13,035	20,397	6,767	CONT.	CONT.
X1452 GEOSAT	344	1,236	1,737	1,731	967	953	973	993	CONT.	CONT.
TOTAL	4,610	11,614	14,507	19,127	17,633	13,988	21,370	7,760	CONT.	CONT.

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This program element supports Navy interests in meteorological and oceanographic (METOC) remote sensors. These interests include commitments to satellite, sensor, and operational development activities associated with three satellite programs: 1) the Joint Service Defense Meteorological Satellite Program (DMSP), 2) The National Polar-Orbiting Operational Environmental Satellite System (NPOESS) and 3) the Navy Geodetic/geophysical Satellite (GEOSAT), funded entirely by Navy. The passive microwave instruments carried on DMSP and future NPOESS provide global oceanic and atmospheric data of direct operational relevance, including sea surface wind, sea ice, precipitation; GEOSAT altimeter data are used to produce significant wave height, ocean circulation, and ocean topography. The Navy (METOC) Support Space provides for Navy participation in Navy/Air Force cooperative efforts leading to current and future DMSP sensor development, including calibration and validation of instruments and delivery of satellite products to the Fleet. A new initiative in 1997, Windsat, on the Coriolis spacecraft, is a partnered program to meet multiple Naval remote Sensing requirements and provide risk reduction effort for the Department of Commerce/National Oceanic and Atmospheric Administration /Department of Defense converged satellite program, National Polar-Orbiting Operational Environmental Satellite System (NPOESS). The Navy METOC Support (Space) project supports the Navy contribution to Windsat, which is fully funded via a formalized inter-agency agreement. The NPOESS Integrated Program Office is providing a portion of the funds for the Windsat sensor. The Air Force Space Test Program (STP) will pay for the satellite bus and the launch vehicle. The GEOSAT provided ocean

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 1 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

topography information from 1985-1990. In 1991, the Navy began the development of a follow-on capability to continue providing this required ocean topography information via the GEOSAT follow-on satellite, launched on 10 February 1998. Both of these projects fulfill Navy's obligation to develop Navy-unique, or mission critical technology.

(U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

B. (U) PROGRAM CHANGE SUMMARY FOR TOTAL PE:

	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
(U) FY 1999 President's Budget:	4,753	11,671	13,739
(U) Appropriated Value:		11,671	-
(U) Adjustments from FY 1999 Presbudg:	-143	-57	+768
(U) FY 2000 President's Submission:	4,610	11,614	14,507

(U) CHANGE SUMMARY EXPLANATION:

(U) Funding: FY 1998 adjustment is due to Small Business Innovation Research reduction (-130) and FY 1998 update (-13). FY 1999 adjustments due to revised economic assumptions (-27) and civilian personnel underexecution (-30). FY 2000 adjustments due to Navy METOC-SPACE realignment (+567), Navy Working Capital Fund (NWCF) (+315) and non pay inflation (-210).

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 2 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)

(U) COST: (Dollars in Thousands)

PROJECT NUMBER & TITLE	FY 1998 ACTUAL	FY 1999 ESTIMATE	FY 2000 ESTIMATE	FY 2001 ESTIMATE	FY 2002 ESTIMATE	FY 2003 ESTIMATE	FY 2004 ESTIMATE	FY 2005 ESTIMATE	TO COMPLETE	TOTAL PROGRAM
R0524 Navy (METOC) Support (Space)	4,266	10,378	12,770	17,396	16,666	13,035	20,397	6,767	CONT.	CONT.

- A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Navy Meteorological and Oceanographic Sensor-Space (METOC)-Navy (METOC) Support (Space) project provides for Navy participation in current Defense Meteorological Satellite (DMSP) Special Sensor Microwave/Imager and Special Sensor Microwave Imager/Sounder, and future Navy unique sensor development efforts (Windsat) in support of the Fleet operational requirements. The project ensures Navy operational requirements are satisfied primarily through demonstration of technologies for inclusion on operational constellations such as DMSP and National Polar Orbiting Operational Environmental Satellite System (NPOESS). These reflect Navy unique efforts that are not funded within the Air Force DMSP/NPOESS program, and are in accordance with current inter-agency agreements. The project acquires information necessary to keep Navy ground receiving equipment compatible with future satellite data formats and data transfer rates. The project also provides for studies leading to operational improvements of satellite derived products and implemented via Navy participation as a voting member of the DMSP Configuration Control Board (CCB). Future funding plans respond to emerging Chief of Naval Office requirements for Navy METOC data. Plans for FY 2002 and beyond address the requirement for high-resolution

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 3 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7	PROGRAM ELEMENT: 0305160N	PROJECT NUMBER: R0524
	PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic Sensors-Space (METOC)	PROJECT TITLE: Navy METOC Support (Space)

METOC imagery to ships, in particular, in the data denied Indian Ocean area.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACOMPLISHMENTS:

- (U) (\$68) Participated in DMSP Special Sensor Microwave/Imager (SSM/I) Calibration/Validation. Continued data quality assurance activities in support of operational products.
- (U) (\$924) Conducted GEOSAT /follow-on launch and early orbit calibration/validation activities. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conducted associated C4ISR analyses and studies.
- (U) (\$3,274) Completed preliminary design and analysis for Windsat and breadboard sensor and subsystems leading to a prototype instrument.

2. (U) FY 1999 PLAN:

- (U) (\$500) Conduct SSM/I calibration and validation. Prepare for validation effort associated with the expected launch of the first DMSP Special Sensor Microwave Imager/Sounder (SSM/I/S).
- (U) (\$1,401) Design and fabricate Airborne Polarimetric Microwave Imaging Radiometer (APMIR) to use for calibration/validation of DMSP SSM/I, and SSM/IS, and Windsat development, calibration, and validation.
- (U) (\$8,477) Continue Windsat sensor design and initiate fabrication of flight hardware. Support spacecraft design effort.

3. (U) FY 2000 PLAN:

- (U) (\$815) Continue to monitor SSM/I performance and prepare for validation effort associated with the expected launch of the first DMSP SSM/IS.
- (U) (\$612) Conduct field experiments with APMIR to use for calibration/validation of DMSP SSM/I and

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 4 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Navy Meteorological and Oceanographic PROJECT TITLE: Navy METOC
Sensors-Space (METOC) Support (Space)

SSM/IS sensors, and Windsat development, calibration, and validation.

- (U) (\$11,343) Complete final Windsat sensor design and continue fabrication of flight hardware. Prepare for Windsat calibration and validation.

B. (U) PROGRAM CHANGE SUMMARY: See total program change summary for P. E.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0305160F, Air Force DMSP

(U) PE 0604218N, Air/Ocean Equipment Engineering

D. (U) SCHEDULE PROFILE: Not applicable.

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
a. Satellite Development	0	1,000	3,911
b. Payload Development	3,274	7,477	7,432
c. Science and Calibration/Validation	68	500	815
d. Airborne Testbed	0	1,401	612
e. Support GFO	924	0	0
Total	4,266	10,378	12,770

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 5 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

<u>Contractor/ Government Performing Activity</u>	<u>Contract Method Fund Vehicle</u>	<u>Award/ Oblig Date</u>	<u>Perform Activity EAC</u>	<u>Project Office EAC</u>	<u>Total FY 1997 & Prior</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Product Development Misc.	Misc.	N/A	CONT.	CONT.	727	3,274	8,477	11,343	CONT.	CONT.
Support and Management: Misc.	Misc.	N/A	CONT.	CONT.	0	924	0	0	924	924
Test and Evaluation: Misc.	Misc.	N/A	CONT.	CONT.	0	68	1,901	1,427	CONT.	CONT.

R-1 Line Item 180

Budget Item Justification
(Exhibit R-3, page 6 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET PROGRAM ELEMENT/PROJECT COST BREAKDOWN

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: R0524
PROGRAM ELEMENT TITLE: Defense Meteorological Satellite PROJECT TITLE: DMSP-Navy Support

TOTAL: 727 4,266 10,378 12,770 CONT. CONT.

GOVERNMENT FURNISHED PROPERTY: Not Applicable

	<u>FY 1997 & Prior</u>	<u>FY 1998 Budget</u>	<u>FY 1999 Budget</u>	<u>FY 2000 Budget</u>	<u>To Complete</u>	<u>Total Program</u>
Subtotal Product Development	727	4,266	10,378	12,770	CONT.	CONT.
Subtotal Support and Management:	0	0	0	0	0	0
Subtotal Test and Evaluation:	0	0	0	0	0	0
Total Project	727	4,266	10,378	12,770	CONT.	CONT.

R-1 Line Item 180

Budget Item Justification
(Exhibit R-3, page 7 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
 PROGRAM ELEMENT TITLE: Navy Meteorological And Ocean Sensors-Space (METOC)

(U) COST (Dollars in thousands)

PROJECT NUMBER & Title	FY 1998 ACTUAL	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 ESTIMATE	To Complete	Total Program
X1452 GEOSAT	344	1,236	1,737	1,731	967	953	973	993	CONT.	Cont.

- A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project provides a satellite-borne radar altimeter sensor to obtain ocean topography measurements from which tactically significant features such as oceanfronts, eddies, and sea-ice edges are derived. Topography provides a unique and important data source in support of a number of Naval warfare areas such as anti-submarine and undersea warfare, as well as providing other agencies such as National Oceanic and Atmospheric Administration and National Aeronautics and Space Administration with valuable inputs to studies involving El Nino, global warming and climate change. Data was previously provided by GEOSAT from 1985 until the satellite failed in January 1990. The GEOSAT Follow-On (GFO) satellite is intended to provide interim altimetry data until altimetry data becomes available on a future environmental satellite.

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 8 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
 PROGRAM ELEMENT TITLE: Navy Meteorological and Ocean
 Sensors-Space (METOC)

PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 1998 ACCOMPLISHMENTS:

- (U) (\$337) Monitored launch operations, satellite performance and acceptance.
- (U) (\$7) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) implementation guidance. Developed and updated Naval C4ISR mission to incorporate an overarching operational, systems, technical and information architecture. Conducted associated C4ISR analyses and studies.

2. (U) FY 1999 PLAN:

- (U) (\$800) Fund on-orbit performance incentive.
- (U) (\$436) Continue to monitor satellite performance. Conduct altimeter calibration/validation activities.

3. (U) FY 2000 PLAN:

- (U) (\$800) Fund on-orbit performance incentive.
- (U) (\$937) Continue to assess on-orbit system performance and conduct payload calibration and validation. Maintain ground segment hardware and software.

B. (U) Program Change Summary: See total program change summary for P.E.

(U) Schedule: Not applicable.

(U) Technical: Not applicable.

C. (U) OTHER PROGRAM FUNDING SUMMARY: Not applicable.

(U) RELATED RDT&E:

(U) PE 0604218N (Air/Ocean Equipment Engineering)

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 9 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
PROGRAM ELEMENT TITLE: Navy Meteorological and Ocean
Sensors-Space (METOC)

PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

D. (U) SCHEDULE PROFILE:

	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
Program Milestones		Launch Sat #1		
Engineering Milestones	FRR 3Q			
T&E Milestones		On Orbit Tests		
Contract Milestones	Not Applicable			

R-1 Line Item 180

Budget Item Justification
(Exhibit R-2, page 10 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N
 PROGRAM ELEMENT TITLE: Navy Meteorological and Ocean
 Sensors-Space (METOC)

PROJECT NUMBER: X1452
PROJECT TITLE: GEOSAT

A. (U) PROJECT COST BREAKDOWN: (\$ in thousands)

Project Cost Categories	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>
a. Satellite Development	344	1,236	1,737
b. Sensor Development	0	0	0
c. Contractor Engineering Support	0	0	0
Total	344	1,236	1,737

B. (U) BUDGET ACQUISITION HISTORY AND PLANNING INFORMATION (\$ in thousands)

PERFORMING ORGANIZATIONS

Contractor/ Contract

R-1 Line Item 180

Budget Item Justification
(Exhibit R-3, page 11 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7 PROGRAM ELEMENT: 0305160N PROJECT NUMBER: X1452
 PROGRAM ELEMENT TITLE: Navy Meteorological and Ocean PROJECT TITLE: GEOSAT
 Sensors-Space (METOC)

Government Performing Activity	Method Fund Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
--------------------------------------	---------------------------	-------------------------	----------------------------	--------------------------	-----------------------------	-------------------	-------------------	-------------------	----------------	------------------

Product Development

Ball Aerospace w/Options	CPIF	8/92	85,213	85,213	82,458	344	800	800	CONT.	CONT.
Various	Various	N/A	CONT.	CONT.	6,361	0	436	937	CONT.	CONT.

Support and Management: Not Applicable

Contractor/ Government Performing Activity	Contract Method Fund Vehicle	Award/ Oblig Date	Perform Activity EAC	Project Office EAC	Total FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
---	---------------------------------------	-------------------------	----------------------------	--------------------------	-----------------------------	-------------------	-------------------	-------------------	----------------	------------------

Various					2,881	0	0	0	CONT.	CONT.
---------	--	--	--	--	-------	---	---	---	-------	-------

Test and Evaluation: Not Applicable

GOVERNMENT FURNISHED PROPERTY Not Applicable

	FY 1997 & Prior	FY 1998 Budget	FY 1999 Budget	FY 2000 Budget	To Complete	Total Program
Subtotal Product Development	82,458	344	1,236	1,737	CONT.	CONT.

R-1 Line Item 180

Budget Item Justification
 (Exhibit R-3, page 12 of 13)

UNCLASSIFIED

UNCLASSIFIED

FY 2000 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET

DATE: February 1999

BUDGET ACTIVITY: 7	PROGRAM ELEMENT:	0305160N	PROJECT NUMBER:	X1452			
	PROGRAM ELEMENT TITLE:	Navy Meteorological and Ocean Sensors-Space (METOC)	PROJECT TITLE:	GEOSAT			
Subtotal Support and Management		2,881	0	0	0	CONT.	CONT.
Subtotal Test and Evaluation Not Applicable							
Total Project		85,339	344	1,236	1,737	CONT.	CONT.

R-1 Line Item 180

Budget Item Justification
(Exhibit R-3, page 13 of 13)

UNCLASSIFIED